

Binary Search (on an array)

Below is our pseudocode for recursive Binary Search on an array. This handout is so you can see the function typeset in the CLRS pseudocode style. The algorithm returns the position in the array A where the key is found, or NIL if the key is not found.

BINARYSEARCH($A, low, high, key$)

```

1  if  $low > high$ 
2      return NIL
3   $mid = \lfloor (low + high)/2 \rfloor$ 
4  if  $key == A[mid]$ 
5      return  $mid$ 
6  elseif  $key > A[mid]$ 
7      return BINARYSEARCH( $A, mid + 1, high, key$ )
8  return BINARYSEARCH( $A, low, mid-1, key$ )
    
```

Here's how to typeset binary search in the CLRS style:

```

\begin{codebox}
\Procname{$\proc{BinarySearch}(A, \id{low}, \id{high}, \id{key})$}
\li \If $\id{low} > \id{high}$
\Then
\li \Return \const{Nil}
\End
\li $\id{mid}$ \gets $\lfloor (\id{low} + \id{high})/2 \rfloor$
\li \If $\id{key} == A[\id{mid}]$
\Then
\li \Return $\id{mid}$
\li \ElseIf $\id{key} > A[\id{mid}]$
\Then
\li \Return $\proc{BinarySearch}(A, \id{mid}+1, \id{high}, \id{key})$
\End
\End
    
```

```
\li \Return $\proc{BinarySearch}(A, \id{low}, \id{mid - 1}, \id{key})$  
\end{codebox}
```